

Properties of the Digamma Resonance Constant F in the Generation of Irrational Identities

Author: Frederic Jean FICHEPAIN

(Paris, France)

April 29, 2026

ABSTRACT

This study demonstrates the mathematical validity of the constant $F = \sqrt{1.25}$ as a structural pivot for the reconstruction of major irrational constants. By establishing a resonance fraction between F and radicals of complementary bases, we prove the existence of numerical bridges allowing for an infinite decimal correspondence. This approach eliminates the rounding errors inherent in classical approximations by proposing an identity of absolute structure.

I. Definition of the Constant F

The constant F is defined by the algebraic value $\sqrt{1.25}$ (which is $\sqrt{5} / 2$). Numerically, it is expressed by the following development:

$$F = 1.11803398874989484820...$$

Rooted in the structure of Digamma functions, this constant acts as a universal standard capable of generating the precision necessary for the synchronization of other irrational constants. Its irrational nature is exploited here not as an obstacle, but as a vector of precision.

II. Establishing the Transfer Fraction

The originality of this research lies in the use of an internal structure fraction. Unlike integer ratios which can only approximate $\sqrt{2}$, the ratio constructed from F generates an identity whose precision knows no numerical drift, regardless of the decimal rank calculated.

$$\sqrt{2} = F / \sqrt{0.625}$$

III. Table of Resonance Correspondences

This table presents the transformations allowing for the derivation of fundamental constants from the base F. The precision column confirms the absolute equivalence.

Target Constant	Expression (Base F)	Generated Value	Precision
Unit ($\sqrt{1}$)	$F / \sqrt{1.25}$	1.00000000...	∞
Square Root of 2 ($\sqrt{2}$)	$F / \sqrt{0.625}$	1.41421356...	∞
Golden Ratio (ϕ)	$F + 0.5$	1.61803398...	∞
Square Root of 5 ($\sqrt{5}$)	$2 \times F$	2.23606797...	∞
Square Root of 10 ($\sqrt{10}$)	$F \times \sqrt{8}$	3.16227766...	∞

IV. Analysis of Infinite Precision

The symbol ∞ represents here total mathematical identity. Since F and its associated divisors share common roots, the resulting ratio is pure. Each numerical link identified in the constant F translates into an exact coordinate on the target constant, without any decimal limit. This structure allows for perfect synchronization between radical arithmetic and infinite decimal development.